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Electricity on the Farm

October 1928

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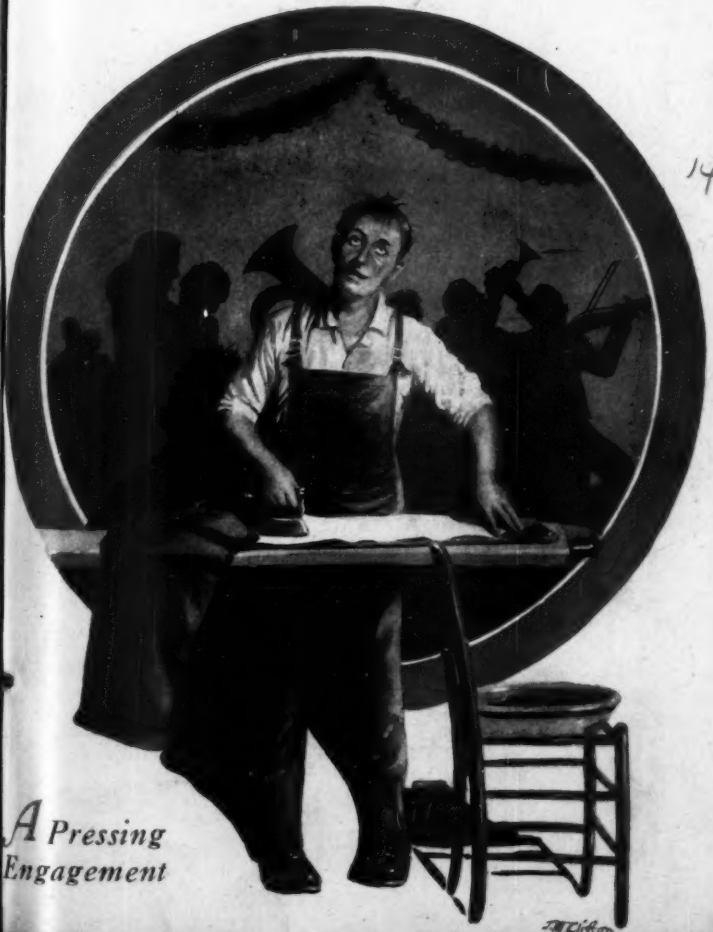

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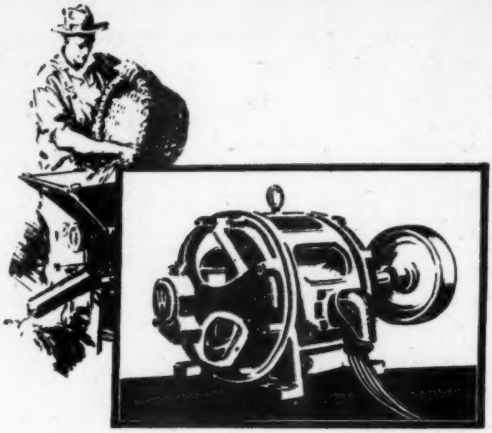

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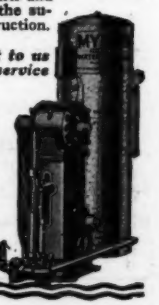

Electricity on the Farm

Vol. 1 OCTOBER 1928 No. 16

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Electricity on the Farm

Vol. 1 OCTOBER 1928 No. 16

Electricity Pays Its Way

Elsewhere in this issue will be found the first installment of an article by Mr. Charles F. Stewart, Chairman, Rural Electric Service Committee, of the National Electric Light Association, on the results of four years of electrified farming on the Red Wing (Minnesota) experimental line.

As the farms along this line are ordinary farms in every sense of the word, and as all records over the period of four years were carefully maintained by officials of the University of Minnesota, the information secured is of real value to the farmer as a guide to what he may expect in using electric current for farm operation.

Of especial interest is the fact that electricity paid for its own keep, it paid ample over head charges on all strictly electrical equipment, it paid ample overhead charges on much equipment more properly chargeable to a higher standard of living, and above all this, it made for the five Red Wing pioneer electrical farmers a liberal profit.

This article is deserving of careful reading by farmers who are using electric service, or by those who contemplate its use.

Four Years of Electrified Farming

By CHARLES F. STUART*

FOUR years ago, when there was considerable doubt in the minds of agricultural engineers, power company officials and others as to the feasibility of extending central station electric service to farms, a rural test line was built by the Northern States Power Company, of Minneapolis, Minn. The objects of this line, known as the Red Wing Experimental Line, were to determine, if possible, just how electricity would affect farming and whether or not it could be used in farm operations with profit both to the farmer and the power company. Mr. Stuart very ably outlines in the following article the results of four years' experience with the line.

On August 15th I received a telegram from the editor of this magazine which read somewhat as follows:

"WILL YOU PREPARE FOR US AN ARTICLE TELLING WHAT THE REPORT ON FOUR YEARS OF ELECTRIFIED FARMING AT RED WING, MINNESOTA, MEANS TO THE AMERICAN FARMER."

Without giving the matter due consideration, I wired back an affirmative answer to this request, but now when it comes to the actual task of writing the article itself it is difficult indeed adequately to express in words all that this report may mean to American agriculture. The summarization of four years of electrified farming on the little group of farms which constitutes the first experimental electrified farming community in the world is of such infinite import, so varied in its ramifications and potentialities that it constitutes something rather stupendous, rather difficult to describe, something a little bit too big to comprehend. At times I think it is almost too good to be true, but the facts are there and the figures are there and they have been analyzed and re-analyzed, probed and criticized in an effort to find any material flaw, and all without avail.

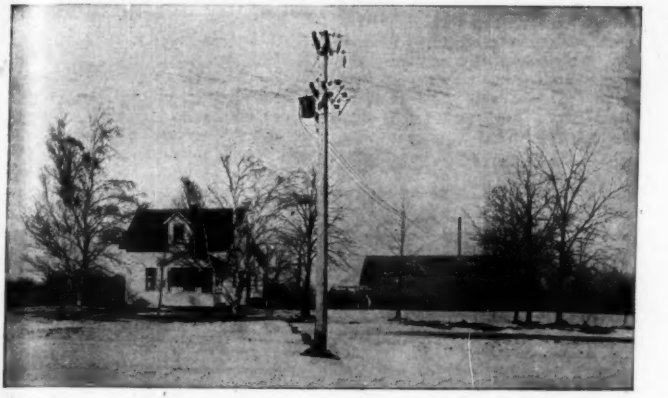
Hence they must be taken as they are, but before any attempt is made to describe what this report may mean to American farm life the readers of this magazine should be made familiar with a little of the history of the Red Wing experiment and the nature of the report covering the first four years of its operation.

Eight Farms Selected

In the fall of 1923, the Minnesota Committee on the Relation of Electricity to Agriculture, made up of representative farmers, agricultural educators, and representatives of power companies, picked a group of eight farms several miles from Red Wing, Minnesota, as the basis of a proposed experiment. The purpose was to determine whether electric service could be extended to the farm on a basis satisfactory to both farmer and power company.

Prior to that time the comparatively few farmers in the United States who were served by electric light and power companies were very conservative customers using electricity usually only for lighting and one or two minor household appliances. The high cost of distribution lines necessary to reach the scattered farm customers was all out of proportion to the

* Chairman, Rural Electric Service Committee, National Electric Light Association; and Assistant to Vice President, and General Manager, Northern States Power Co., Minneapolis, Minn.



One of the Red Wing Line Farms.

limited use farmers made of the service and, as a consequence, either the rate to the farmer was prohibitive, or the power company was losing money, or both.

The committee responsible for the Red Wing project conceived a new vision of electricity on the farm. Instead of a few electric lights and an iron this vision embraced the employment of electricity for a multiplicity of purposes. In fact, the purpose was to electrify the farm factory the same as the city factory has been electrified and with the hope of as favorable results.

Complete Equipment

The Northern States Power Company financed and built the line to serve the chosen community. Some thirty or forty manufacturing companies proffered practical co-operation by the loan of every conceivable form of electric farm and barn equipment. The Agricultural College of the University of Minnesota, as a neutral agency, assumed charge of directing the work and keeping track of the records. Professor E. A. Stuart of the College of Agriculture, was assigned by Dean W. C. Coffey, a member of the state committee, as Project Director.

The first current was turned into the line on Christmas Eve, 1923, and was utilized to light a Christmas tree in the front yard of the William A. Cady farm, but it was not until the beginning of 1924 that the farmers really began to employ electricity. The outlook for a successful conclusion at that time was not very encouraging. Past experience with rural lines had been most disappointing, but there was one thing which everyone concerned was definitely agreed upon and that was that a sincere effort should be made to solve the problem, no matter whether it resulted in success or failure.

When four years had passed covering the period from January 1, 1924 to January 1, 1928, Professor Stuart began putting into shape a tabulation of what electricity liberally and intelligently used had achieved. Continuous records were available for only five of the original eight Red Wing farms. On the three farms continuous records were not available because of change of tenants, or ownership, or failure to keep early figures. Full and adequate records, however, were available for the other five and they constitute a number sufficient to present a full and complete story.

Here is one table of figures taken from the report which Professor Stuart is about to issue and which fully visualizes the fundamental conclusions. It presents the financial condition of these farms the year when electricity was first employed and depicts the changes as they occurred during the second, third and fourth years. This table of figures is worth perusal. Read it.

RED WING EXPERIMENTAL LINE
SUMMARY OF REVENUES, EXPENSES AND INCOME FOR 5 FARMS

	1924	1925	1926	1927
1. Gross Revenues	$17,366.41	$20,052.99	$20,400.48	$24,821.12
2. Percent Increase	.....	15.4%	17.5%	42.9%
3. Less Operating Expenses...	$9,644.64	$9,555.50	$8,737.21	$9,746.18
4. Increase or decrease 1924..	.....	—0.2%	—9.4%	+1.0%
5. Net Operating Revenues from Operation of Farms.....	$7,721.77	$10,497.49	$11,663.27	$15,074.94
6. Less Adjustments for Stock Purchases, Deferred Bills, Changes in Inventories..	$845.07	$700.64	$1,228.19	$2,628.32
7. Net Incomes	$6,876.70	$9,796.85	$10,630.70	$12,446.62
8. Increase over 1924.....	.....	42.5%	54.6%	81.0%

It is a small space into which to condense the fundamentals of four years of pioneer experimentation in the application of electricity to agriculture, but nevertheless it presents the high spots of the entire period. It will be seen that from the day electricity first was employed on these five farms there began a definite improvement in their financial condition. The fourth year showed an increase of 42.9% in gross revenue over the first year and an increase of only 1% in operating expenses, and as a consequence with practically all the increase in the gross going into the net, the net income for the fourth year was 31% in excess of the first year.

It is a remarkable financial statement. I leave it to the judgment of the reader if it does not constitute quite a stupendous subject for thought and if it does not answer many of the questions and doubts expressed in the past about the possibilities of extending electric light and power company service to the American farmer.

(The second and concluding installment of this article will appear in the November issue.)

Keeping the Farm Motor in Good Condition

By E. F. ROGERS

An electric motor is an ideal hired man who consumes no food, is always ready to work and whose wages amount to only a few cents an hour. It is certainly worth while to spend a few minutes at rare intervals to keep such a man in good humor so that he will continue to give service when called upon and not lie down on the job at some critical period.

After an electric motor has been installed, it is a pleasure to find that all you have to do is push a button or throw a switch and the motor responds immediately. It is then an all too easy matter to assume that this condition will always exist and forget that an electric motor sometimes requires attention to keep it in good running order. Practically all types of motors put out by reputable manufacturers require very little care but, nevertheless, a certain amount of attention is desirable if the maximum amount of service is to be obtained. A modern industrial plant with electrically operated machines requires the services of a corps of electricians who make periodic inspections and for the same reasons the farm motors should be inspected periodically in order to forestall trouble. A good scheme is to mark a certain day on the calendar of each month as a reminder that the electrical

(Continued on page 33)

A Home-Made Poultry Feed Mixer

By C. E. SEITZ

IN the article entitled, "We'd Hardly Know How to Get Along Without It," appearing in the April issue of ELECTRICITY ON THE FARM, I mentioned a home-made feed mixer. I have received so many inquiries about this mixer that I have asked Mr. Fricke to tell us more about it.

"On our poultry farm," said Mr. Fricke, we use only the highest grade ingredients we are able to obtain in mixing our feed and are then able to save about 25% in cost over using feed already prepared. When using the corn and other grains grown on our farm the saving is still greater.

"The extra time required in mixing 600 lbs. of feed at a time in the mixer is about 50 minutes when operated by hand with a rope and windlass. But we hope soon to add gearing to this machine so it may be driven by motor which will accomplish the same task in about 10 minutes.

"One can hardly hope to mix any feed at home that will quite equal the high grade perfectly balanced commercial feed in the market, but since we have had such excellent results in past years with our own mixtures, getting a 50 to 60% egg production all winter from a flock only one-third pullets, we can see no reason for changing at present. Then, too, we would hardly know how to dispose of our corn, wheat, oats, sunflower seed, sour milk, etc., to advantage if we did not mix our own feeds."

The home-made mixer used by Mr. Fricke is a wood and sheet metal drum 4 feet in diameter and 4 feet long. The ends are 4 feet in diameter and built up of matched lumber with 1" x 2" cleats nailed on the outside. The drum is braced from end to end with four 1" x 1½" wood strips equally spaced across the outside. Four 1" x 1½" wood strips extend from end to end on the inside as shown and serve as agitators or mixers. The drum is mounted between two upright posts on a 1" round iron shaft, a pulley can be attached direct to one end of the drum. A feed bin of sufficient capacity to hold the entire contents of the mixer is placed under the drum so that the mixed feed can be dumped directly into the bin. The cover is constructed as shown in the illustration.

The labor and materials used in making the drum mixer amounted to approximately $17.50.

Here's the Fricke Feed Mixer

The Water Tap

Running Water Cuts off a Generous Slice of Work About the Farm

The First Step Toward a Complete Water System.

WHEN the city man wants to wash his hands, he does not go out to the well for a pail of water. There probably has not been a well in his back yard for thirty years. He turns a faucet instead. Powerful pumps miles away lift it for him from deep artesian wells, or send it flowing along great aqueducts from some distant water basin.

Water is not free in the city. Some one has to pay for the pumping, and the piping, and the servicing. But where families are crowded together, maybe seventy-five or a hundred along the two sides of a mile of street, the cost of getting water to each family is not high.

The man on the farm has always had to provide his own water system. For centuries it was a well or spring. With the advent of cheap accessible power, it is becoming a copy of the city system, cut down to individual needs, but providing, as the city system does, running water always ready in the house and barns.

A jack on the pump is the simplest way of motorizing the well. If it is geared to an electric motor, it will pump the water at the turn of a switch.

A good pump jack must be sturdy and well built to stand the strain of constant use. Its bearings should be good sized, and self oiling; its gears covered and running in oil. To make it absolutely weatherproof there should be no exposed wiring.

Pump Jack First

The pump jack can be the first step toward a complete automatic system. The jack will pump the water into a tank from which it will flow through any faucet as it is needed. A gravity tank is the simplest arrangement. Any tank set high enough to give a sufficient fall to the highest faucet on the place will do. The jack pumps the water up, and gravity carries it down when anyone opens a faucet.

It is not an easy matter to get the proper elevation and at the same time protect the tank from winter's cold and summer's heat. A farmer who has a nearby knoll higher than his house sometimes builds a concrete cistern there and pipes the water back to his

house. Some men put the supply tank in the top of the silo.

But it is often quite as cheap and more satisfactory to provide a pressure tank of one kind or another. Here the pressure in the tank itself will force the water through the pipes when someone turns a faucet.

A special switch on these tanks turns the motor on and starts the pump when the pressure drops. The inflowing water constantly raises the pressure, and when this pressure reaches the point fixed by the setting of the switch, it cuts the current off and the pumping stops.

Automatic Systems

There are a great many completely automatic systems on the market. They have the pump, the motor, and sometimes the tank, too, all built together. They come ready to set up and take complete charge of the job of getting the water from the well to the faucet.

Shallow well systems and deep well systems, or systems that will pump from both at once are on the market. They may all look much alike, but the wise buyer knows that one of the most important things about any water systems doesn't show in a picture, but stands out very clearly over the years of use, that is the manufacturer.

A man buys his binder from a firm whose character and integrity he has confidence in. He should know that the maker of his water system builds character into his product as well. And the dealer is another point to consider. A man who would not dream of buying his car from a dealer who was not near enough to service it for him may overlook the fact that a dealer close at hand to insure uninterrupted service from his new water system is quite as important.

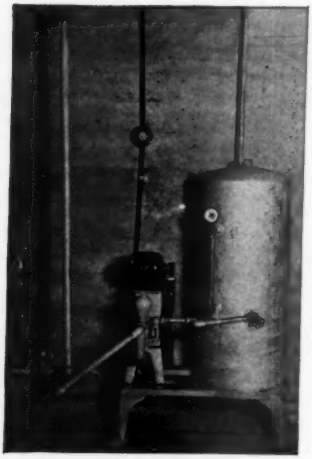
The city man's wife does not carry out waste water and throw it in her back yard. The city does that for her, too. Her husband pays for it, of course, first in special assessments for laying the sewers and later as a part of his regular taxes. But it is carried away and disposed of where it can offer no menace to the water supply or the city well-being.

The farm water system should be supplemented with a means of sewage disposal, too. The septic tank is most satisfactory for this. It is safe and efficient, guarding

Where There Is a Water System.

the well from possible pollution.

The comfort and service a man gets from his water system depends upon the wisdom of his selection. If he needs 400 gallons an hour, he cannot expect a pump rated at 250 gallons to give him



Pumping Soft Water to the Kitchen and Bathroom.

satisfaction. If he chooses the larger pump, but selects a motor just a size too small, he will overload it, and shorten its useful life.

No one needs to guess at the right equipment for his farm. Any manufacturer of pumps will gladly give a careful, accurate estimate of the pump size, the motor size, and all of the details of piping to any one who sends in a statement of his conditions.

Depth of Well Important

Even without this help it is not difficult to form a general idea of the system that will be required. The depth of the well is one determining factor. If the vertical distance from the pump to the water is not more than 22 feet, a shallow well system can be used. It need not be placed directly over the well or cistern. But if the pump is more than 22 feet above the water, it must be of the deep well variety, and must be placed directly over the well. The amount of water each person, or each animal requires will give some idea of the proper pump capacity.

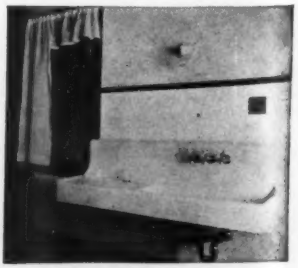
It should be remembered that when water is instantly available at the faucet, a great deal more will be used than before the system was installed. Most estimates are made on the basis of the following figures:

	Gallons
Person (bath room).....	25
Person (no bath room)....	12
Cow	10
Horse	10
Hog	2
Sheep	1

The main thing is not to install too small a system. For additional uses for water are very likely to develop.

The motor size and the amount of electricity it will use will vary widely with the depth of the well, rate of pumping and other conditions, but generally speaking a kilowatt hour of electricity will pump and deliver from 500 to 1000 gallons of water.

Lights and running water cut off a generous slice of work about the farm. When a man has them at his finger tips, he has caught up with the chief luxuries of modern civilization.



Carrying Water Into the Kitchen.

A Guide to Good Farm Lighting

By W. C. BROWN and M. S. MEAKER
Engineering Department, National Lamp Works of General Electric Company

IN the old days the hay barn or loft was probably a less scientific place than it is today; certainly it was not devoted exclusively to the storing of hay. The loft was the scene of hunts for hidden hens' nests, the secret place of a box of apples that belonged by special rights to the small boys, and the "gym" where the hired boy occasionally found time to entertain us with stunts on his trapeze. Needless to say, all of these diversions took place during daylight hours, when sunlight poured into the loft through the small windows high in the peak.

The real work of pitching down hay generally took place at night or early in the morning, when the only light was that from kerosene lanterns carried by the workers. At such times the loft was a dangerous place, full of dark pitfalls, and the lanterns had to be handled carefully and watched because of the likelihood of their setting fire to the hay.

Lighting Made Safe

Safe lighting for the barn has been made possible for the first time by electricity. And not only has the fire hazard of kerosene lanterns been removed, but safety and comfort have taken the place of the old danger of accidents in getting about and forking down the hay.

An efficient method of lighting the typical high-roofed barns and haymows is the use of 100-watt inside-frosted lamps in angle reflectors—or in dome reflectors set at an angle—mounted fairly high in central posts or tiebeams, or over the door, and directing the light into the various sections of the loft. Two lighting units directed to each side are needed for good lighting in large barns.

The barn lighting installation

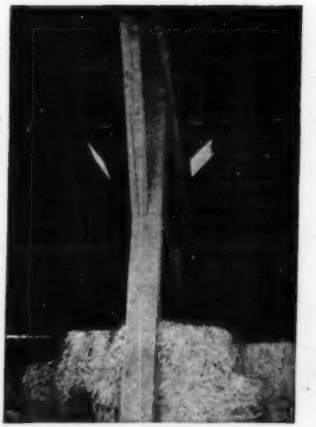


Fig. 1. Lighting a small hay barn by "flooding" it from 100-watt inside-frosted lamps in angle reflectors mounted fairly high on a central post. One reflector directs light into each half of the barn.

Fig. 2. Showing one end of a small barn lighted, as explained, by illustration No. 1.

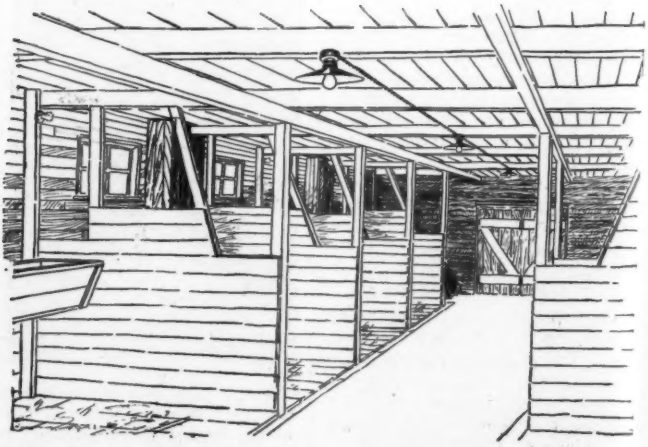


Fig. 3. Suggested lighting for the horse barn, using 100-watt inside-frosted lamps in shallow reflectors. Reflectors should always be used where there is a dark ceiling.

is used for relatively short periods, and the operating cost is therefore low. The comfort and convenience to be had from plenty of light easily justifies its use. When the lamps in the barn lighting system burn out, it is certainly false economy to replace them with lower wattage lamps.

There should be a switch for the barn lighting system at the most used entrance. If two doors are often used, "three-way" switches should be installed so that the lights can be turned on or off at either door.

Horse Barn and Stalls

In the horse stalls, light is required for cleaning, harnessing, and at feeding time. When stalls are located on both sides of a central aisle, sufficient light is obtained from 60-watt or 100-watt inside-frosted lamps in reflectors mounted along the center of the passageway and as near the ceiling as possible. With this high mounting the maximum amount of light is directed into the stalls on either side. One reflector should be mounted on the partition line between every other pair of opposite stalls. With this arrangement each lighting unit provides light for four stalls.

It is suggested that a 15-watt inside-frosted lamp be mounted, out of reach of the horses' heads, on the wall or on a joist between each two stalls. These lamps should be on individual switches, to be used only when needed. They will be found very handy when working in the stalls.

For a box stall, a 40-watt or 50-watt lamp in an RLM or a shallow dome reflector, mounted close to the ceiling at the center of the stall, is ordinarily sufficient. The switch should preferably be located outside the stall door.

Beef Cattle Barn

Adequate lighting in the beef cattle barn makes it possible to extend the feeding hours, or to take care of the feeding after

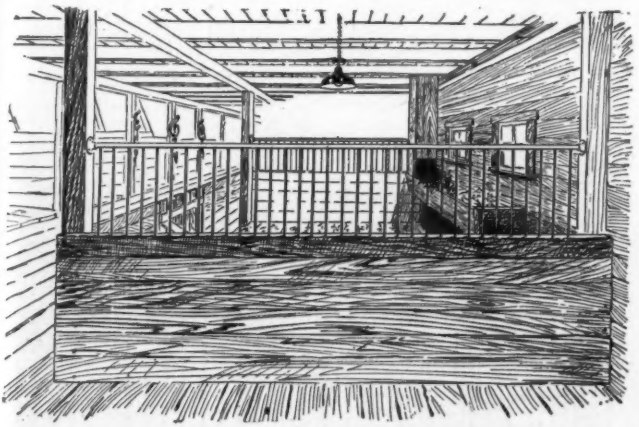


Fig. 4. A single 40 or 50-watt lamp in a good reflector is generally sufficient for the box stall.

night has fallen and other chores have been finished. There are many different types of beef barns, and it would be difficult to establish definite rules for lighting that would apply to all of them. Feeding is the major

(*Continued on page 24*)

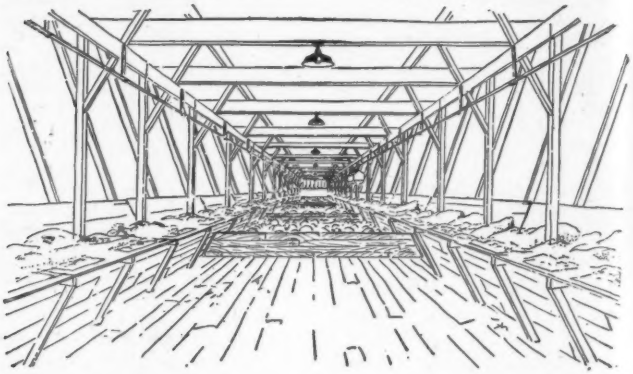


Fig. 5. Lighting recommendation for a typical sheep barn — 60-watt inside-frosted lamps in RLM reflectors spaced about 20 feet apart.

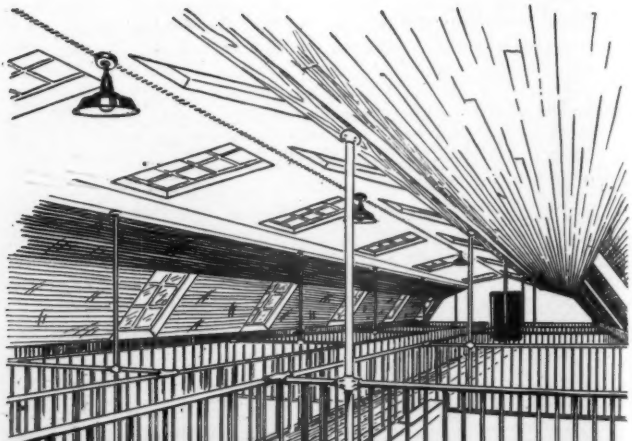


Fig. 6. Suggested lighting for a community hog house.

Feed Grinding on Keystone Farms

By O. W. ROWLANDS

IN March, 1927, we installed a hammer type feed mill on our Certified Dairy Farm. It is operated by a 5 H.P. electric motor direct connected to the shaft of the mill. The motor and mill run at 3600 R.P.M. While our farm —known as Keystone Farms—is considerably larger than the average, we find that this one small mill grinds all the feed we need for our 355 head of dairy cows, young stock and 15 head of horses. It is our opinion that if our herd were TWICE as large, this one mill would be adequate for our feed grinding requirements.

Too many farmers are inclined to judge the small motor mill without sufficient study and investigation. Many of them say: "That little mill is all right for the man with 12 or 15 cows, but for my herd of 40 cows, I should have a larger mill." Right there is where they lose the big point. The mill is small, of course, and purposely so. The capacity is in proportion to the motor used, and with a 5 H.P. motor, the capacity is not as large as with a large tractor driven mill.

But here's the difference. We have it set up so it is entirely automatic. Hence, no labor charge. What particular difference does it make whether it takes ten minutes or thirty minutes to grind the daily grist, as long as no one is there to watch it? The man who pressed the button to start the mill goes on with his work elsewhere in the barn. The kw.hr. consumption is practically the same with either the big capacity or the small capacity mill for the same number of pounds ground. We formerly used a buhr type mill, tractor driven, but find that now our cost of grinding has been reduced to less than 30% of the old cost.

Aside from the greater efficiency of the small motor mill, we find it much more convenient as well as more durable. We grind our feed daily, and in that way always have fresh feed. Under the old method, we ground a week or ten days supply at once, but believe that fresh ground feed is better.

(*Continued on page* 28)

Prevent the Little Fires

By E. R. MEACHAM

FIFTY-SEVEN years ago this month Mrs. O'Leary's cow kicked over a lantern that stood at her heels. Flames spread through the straw, licked up the sides of the barn,—and started the Chicago fire. The horror of that fire was so fixed on our national consciousness that we have made its anniversary our annual Fire Prevention Week.

Fire is levying heavy toll from a hundred farms in the United States and Canada every day. Except in the rare cases where someone sets a fire maliciously, these fires can almost always be traced to some neglect or carelessness.

The use of electricity for light and power does reduce the fire hazards on any farm, but carelessness can turn it, too, into a fire risk.

The first step in keeping it where it belongs is the installation of good wiring. No layman knows just what this is, but there are two national codes designed to help him get it. If a wiring contractor follows their directions he provides wiring that will give safety as well as good service. Some states have codes of their own; complying with them is a legal requirement.

Good Work Essential

So far there has been very little official electrical inspection in the country. Occasionally a Mutual Insurance company will put a clause in its policy demanding that the electric wiring be inspected by the official inspector of a nearby town before the current is turned on. But for the most part the farmer must depend upon the integrity of the contractor that does the work. He can only afford to deal with established, reputable concerns who will be there to stand back of their work in the years to come.

The power company that gives him service is just as anxious as he is to have the wiring safe and adequate. Sometimes it is their policy to insist on an inspection of the wiring before they make the final connection. This is a good check on the work of the contractor.

(*Continued on page 26*)

Electrical Housekeeping

Conducted by GAIL MEREDITH

Halloween

IF you are planning a Hallowe-en party this year, do not forget that lighting can help you decorate your house.

Jack-o'-lanterns have gone electric in the homes where wires carry the lights. If you just cut a hole in the bottom instead of the top when you are making your man, you can set him down over the bulb screwed into an extension cord. This lets you set the jack-o'-lantern around wherever his grin looks best.

I put two small jacks on my mantel last year. The bracket lights made a convenient place for the extensions. Another jack-o'-lantern, much larger, and with a hole in the bottom as well as the top replaced the shade on a floor lamp. I held it in place by making the opening at the top small enough to fit over the wire braces for the shade. His eyes and mouth were large to let through plenty of light.

Red paper over the lights in the hall, golden yellow in the dining room, and greens and blues in basement or attic where you may send your guests, for the usual Halloween tricks, give variety to your decorations.

Black cats and paper witches are not the only adornments at your disposal. Light and color are decorative, too.

A Companionate Ironer

The logical mate for a modern washing machine is an electric ironer. It can cut down the labor of ironing to one-third the time and goodness knows what fraction of the woman power.

This most modern ironer has the ironing board and the iron built together. The board is the revolving roll which carries the clothes across the iron, the curved heated shoe. The roll is heavily padded and covered with muslin. It varies in length from 24 to 60 inches; the favorite household size seems to be 30 inches.

Each length has its advocates. The longer rolls will take a sheet folded once, and iron wide table cloths with a single crease. When a woman grows adept at feeding them, she can run a pillow case and towel through side by side, and so hurry up the ironing. But they do take more current for heat, of course, and the small rolls will iron the wider things if they are folded an extra time.

With ironers folding up like a jack knife and standing in a space no bigger than that required by a kitchen chair,—or covering themselves with porcelain tops and becoming convenient tables, the question of finding room for them seems solved.

On some ironers the roll is supported from only one end leaving the other open to slip the clothes over. This is a great advantage in ironing anything but flat work.

The shoe is the business end of the iron. It must heat well and be smooth and hard to give a good ironing surface. Aluminum heats very quickly, but it does show

She Sits Down to Iron

scratches from buttons and hooks, and it does darken the clothes a little. Hard non-scratching enamels or a combination of aluminum and alloys that harden it are better.

The width of the shoe and the speed of the roll both have their effect on the time it takes to run the clothes through. The wider the shoe the better it will iron each time across,—and the slower the roll, the longer chance it will give the iron to press out the wrinkles. If the roll whisks the clothes across the shoe too fast, it will have to carry them around again and again to get them as sleek as a cat's ear.

Starting the machine is just starting the little motor that turns the roll, and setting the shoe in place. Some of these motors start with a button switch; some have devices that start them at a push of your knee, or the pressure of your forearm, or your foot. The tendency has been toward some sort of control that leaves both hands free to send the clothes through.

You can sit down to your work with an electric ironer. That reduces the fatigue of ironing to practically nothing at all. In fact a friend of mine told me of a test they made in a laboratory recently. One hot day she suggested to the woman who does the regular cleaning about the building that she come in and sit down a while.

The only chair in the room was in front of the ironer.

After a minute or two, she turned to the woman and said,

"Oh, by the way, Mrs. Dale, would you mind running some of those clothes through the ironer while you are sitting there?"

"Not at all," she replied obligingly.

And she sat there for half an hour doing the towels and napkins and aprons in the basket beside her. When she finished them, she got up saying,

"Well, I'll be getting back to my work again; I'm rested now."

I'm not going on oath that anyone could coax me into doing the family ironing with the idea of taking a good rest some afternoon,—but compared to the journeying back and forth from stove to board carrying the flat irons I grew up with, this does look something like a vacation.

Portable Heat

This is the time of year when that little bit of extra heat makes just all the difference in the world in the family comfort. As a nation we seem to have passed through the stage when it is looked upon as any particular virtue to sleep in rooms where snow drifts through on the coverlets,—and ice forms in the water pitcher.

Perhaps there are those who sneer at comfort. I am not one of them myself. I can work better if my hands are not numb with cold,— and I particularly hate a bath in a cold bathroom.

That's why I cart my radiant heater about from place to place during these fall days when the furnace isn't going yet, but morn-

JUST LIKE CITY WATER SERVICE

Here's Farm Relief!

—Relief from the deadening drudgery and the money-losing hours spent in carrying water. Think how much better life would be with plenty of fresh running water under pressure, with faucets wherever you want them, in the house, barn, feed yard, garden and garage.

Here's farm relief you can get easily! It's easy to own a Duro Automatic Water System. Duro makes a water system for every possible use—capacities ranging from 150 to 1200 gallons per hour. You can purchase a complete Duro Automatic Water System for a small down payment and then regular easy payments. The nearest Duro dealer or factory representative will be glad to tell you what system you require. Duro, world's largest maker of water systems, assures you completely satisfactory water service.

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as low as
$68.50
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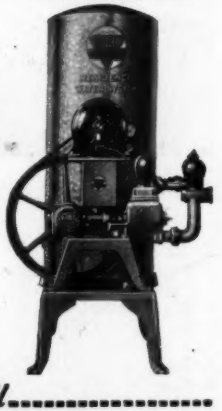


Cut off and Mail

DURO Automatic WATER SYSTEMS

THE DURO COMPANY, 537 E. Monument Ave., Dayton, Ohio

Please send me full information on Duro Water Systems, and free advisory service on my requirements.

Name..... **Address**.....

ings and evenings are chilly. I like it to get up by; I like to have it in the living room when we sit down to read.

One of my friends finds she can hurry her two little girls through the morning ordeal of dressing without constant nagging if she plugs in the heater in their room when she closes their window.

And the cost of this little luxury is not exhorbitant. I know that from my own bills, and I have seen the reports of tests made on four Iowa farms. There radiant heaters used just at random, as those heaters are, took only from

Carrying Comfort Where You Want It

10 to 20 kilowatt hours a month.

Then there is the heating pad. I find mine a source of never failing comfort when nights grow cold. I slip it in bed and let it take the chill off the sheets before I crawl in. It is a blessed relaxation to put my feet way down to the foot of the bed at once instead of curling up in a ball like a porcupine,—to be warm and comfortable right away, not some half hour later when I have warmed up the mattress and covers with my own body.

Oh, there are plenty of hardy souls to scoff at this I know. They are the ones who boast of cold baths and frequent sleeping porches. I let them scoff. With the heating pad in bed, I can let the wind whistle across my face from an open window without a shiver. In fact I find difficulty in staying awake long enough to turn it off.

I forgot it twice last winter. But it is perfectly safe because it is thermostatically controlled and cannot get hot enough to start a fire. It can get too hot for comfort, and the first time that woke me up; the second time I kicked it out of bed and forgot to turn it off.

Even leaving it on all night hardly dented the family budget. Our pad draws 75 watts, so that eight hours use took less than two-thirds of a kilowatt hour. Warming the bed for half an hour every night takes only a little more than a kilowatt hour a month.

Good Farm Lighting

(*Continued from page* 18)

part of the work in such barns, however, and for the feeding alleys a single row of lighting units will ordinarily suffice. RLM reflectors with 50-watt or 60-watt inside-frosted lamps are suggested, mounted at the ceiling along the center of the alley and spaced from 20 to 30 feet apart.

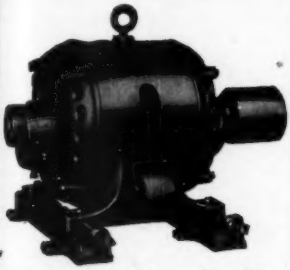
If an overhead loft is provided for the storage of hay, good lighting may be obtained by the methods already given for hay barns and lofts.

Sheep Barns

The lighting requirements of sheep barns are generally similar to those of beef barns. The accompanying sketch shows a typical barn, with suggestions for the lighting layout.

In emergencies, good light in the shepherd's room is greatly appreciated. One 100-watt inside-frosted lamp in an RLM

(*Continued on page* 28)



5 Horse Power Century Type SC Squirrel Cage Induction 3 and 2 Phase Motor

THEY KEEP a-RUNNING

Century Type SC 3 and 2 Phase Motors can be relied upon for continuous service because they are so ruggedly built—electrically and mechanically—that "They Keep a-Running" even when they receive the hard usage that many types of farm equipment are subjected to.

CENTURY ELECTRIC CO.
1806 Pine St. St. Louis, Mo.

35 Stock Points in the United States and More than 50 Outside Thereof

Century MOTORS

Grind Feed without Labor

Grinding feed with the wonderful little Rowell "Whip-it" Hammer-Mill is a snap! Simply dump the grain into the hopper, throw the electric switch—and electric power does the work. Entirely automatic. No engine or tractor to bother with. No grinding plates or stone burrs to worry about and replace.

The "Whip-it" grinds with *hammers*—literally *pounds* the grain into easily digested food, with nothing lost through evaporation, as hammers never run hot. Hammers are hinged—if they strike a foreign substance such as a stone, no damage is done.

A 3 to 5 H. P. runs this mill, grinding at the rate of 18 to 35 bushels an hour, depending on nature and condition of grain. Wonderfully light running. Equipped with New Departure Ball Bearings. Patented automatic feeder. ***A practical mill for either large or small farms.***

Write for descriptive folder and low prices that will surprise you. Save money and make money with one of these wonderful mills.

The I. B. Rowell Company
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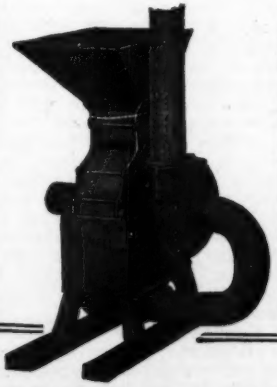


ROWELL HAMMER MILLS

Prevent Little Fires

(*Continued from page 20*)

"Where you find a house that was about half wired in the first place," an electrical inspector told me the other day, "you are apt to find bootleg wiring. That is a frequent source of fires."

Sometimes there are not outlets enough and lamp cord is stretched around the room, over wooden moldings and around baseboards. This is never a wise practice, for lamp cord is not designed for this service.

Not very long ago I went out with this same inspector to look over a little fire on a farm not far from town.

A badly frightened woman opened the door for us and led us through pools of water in the kitchen and the dining room to a dark little bedroom at the end of a hall.

"The fire started down here," she said.

A strand of green cord hung from one of the sockets of the chandelier. I picked it up and saw that it had burned off.

"Where did this go?" I asked.

"I had that cord running to my closet. There isn't any light in there," she answered.

The cord ran through the crack between the door and the jamb. I suppose the door was generally open, but every time that it was shut tight, it rubbed and squeezed that cord until the insulation wore through and the bare wires set fire to the door.

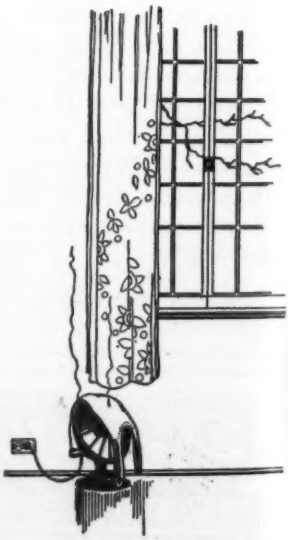
If that circuit had been properly fused, the fuse would have blown and stopped the flow of electricity before it was heavy enough to overheat the wires and burn the door. But on investigation we found that there was no fuse at all on that circuit; a penny kept the current in circulation.

Even when the wiring is in good shape, you may burn it out by overloading your circuits. Each circuit is designed to carry a certain load, and each is protected by a fuse that will permit only a safe amount of electricity to travel over the wires. An overload blows that fuse. You must replace the fuse before the circuit will carry electricity again. If you are so unwise as to put it back into operation with a penny or a couple of strands of copper wire, there will be nothing to tell you when you are putting on too many motors or appliances at once, and you may keep on overloading the wires until they get hot enough to burn off the insulation, and possibly start a fire.

Enclose Large Knife Switches

When the knife switch of a heavy circuit is thrown in for the barns, it arcs enough to actually set fire to dust in the air, to gasoline vapor, or even to chaff and hay. Such a switch should always be enclosed in a tight metal box where it can offer no danger.

A motor may do the same thing on starting so it must be watched, too. If it is kept clean, away from inflammable vapors, and clear of chaff and hay, it is perfectly safe.



"Most electrical fires are the result of the same sort of carelessness that makes matches one of our greatest fire hazards," commented the inspector while we were driving back from our visit to the farm. "Even an electric bulb can start a fire. A lamp really develops a considerable amount of heat. Wrapping a towel around it, or hanging a garment over it to dry, shuts that heat in and lets it increase and increase to the point where it may set fire to the cloth.

"Lots of people use radiant heaters for dryers, too, covering them with a bath towel or drying silk underwear over them, may start a sizable blaze.

"But flat irons start more fires than all the rest. Fortunately they seldom cause serious fires because someone generally smells burning cloth when they get into action."

"I shouldn't think a woman would go off and forget an iron long enough to do any harm," I objected.

"You'd be surprised," returned the inspector. "Not long ago I saw an iron that had been burning for several days. A neighbor of mine was ironing in a first floor laundry. She had just finished up some pressing when the telephone rang. She carried the dress or whatever it was into the living room when she answered the call. It was a message that took her on a hurried trip out of town, and in the haste of her preparations she forgot the iron entirely.

"Left to itself it burned through the ironing board, down through a trunk that the board was standing on, and through the floor. She found it hanging in the basement with the current still on when she came back several days later."

A Nightmare

Lost in the Sahara, dying of thirst and completely surrounded by mountains of peanut-butter sandwiches. —*Harvard Lampoon.*

Fig. 800 Series Complete Water System

Running Water on the Farm

One hundred gallons of water where you want it at a cost of less than one cent! Water is the most valuable convenience on the farm but can you afford to carry it in buckets to and from the kitchen, wash bench, poultry house and in fact to every place it is needed for 1¼c per hour?

BURKS Super Turbine Pumps

LOOK! No belts, no pulleys, no valves, no gears, in fact, ONLY ONE MOVING PART —hence no wear or vibration! These are most important points to consider in the selection of the proper water system for your home. Would you go back to the original chain-driven automobile after using the present day car? We think not. The Burks Super Turbine will literally outwear any other pump yet devised for Home Water Supply Service.

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BURKS SUPER-TURBINE PUMPS
Only one moving part
"A Life-Time of SERVICE"

The LAUSON

Electric PumpJack

will convert your ordinary pump into a water supply unit, controllable all weather by a button in the house, that will unfailingly deliver all the water you want—deep or shallow well, it works equally well.

Built Like a High Grade Auto Transmission

Machine cut hardened gears, fully enclosed, running in oil. Bronze bearings. No chains or sprockets. High grade motor.

Compare with all others. Write for special literature and prices.

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Cut Hair *at* Home

10 Days Free Trial

Anyone can trim or bob hair, shorten bangs, clip neck or under arms with the Home Electric Clipper. Does better work and easier than shears or hand clippers. Will not clog or cut skin. Uses direct or alternating current. Fits any light socket. Thousands in use.
If your dealer cannot supply you, write for circular, or order from this ad. Send no money—pay postman $8.75—return in 10 days if not satisfactory. State whether 110, 220, 32 or 6-volt current is used.

Belle City

BELLE CITY APPLIANCE CO.
Dept. EF, 1022 12th St., Racine, Wis.

Good Farm Lighting

(*Continued from page* 24)

reflector mounted at the ceiling, or 10 to 12 feet above the floor, is suggested.

Hog House

The large hog house, and the community hog house, should be lighted. With the usual gambrel-roof type of house, good lighting is obtained with reflectors mounted as high as practicable along the center of the ceiling, spaced 10 to 20 feet apart, and equipped with 50-watt inside-frosted lamps. A suitably placed yard light will ordinarily care for the outdoor feeding trough.

Feed Grinding

(*Continued from page* 19)

With our present mill, the grain does not heat either in grinding or afterward.

We grind oats and shelled corn, which is stored above the grinding room and spouted down to the mill by gravity. We have not found it practical to grind ear corn or roughage. As we feed a healthy silage ration, we believe that the corn cob itself is of no food value whatever, and because of its large fibre content, is none too good for the cow.

Fine grinding for dairy cattle is neither necessary nor desirable. We use either a ¼" or 3/16" screen for all grinding.

To give an idea of the durability of the mill, we have the original hammers and screens and they are good for many thousands of bushels yet, before being replaced. Nails, stones and bolts do not seem to harm the hammer mill.

Personally, I am 100% sold on the idea of automatic electric feed grinding. I believe my mill paid for itself the first year. If it were not entirely practical and efficient, it would not last long on Keystone Farms. There are no playthings on this farm, where every machine must pay its way, or give place to one which will.

Internationally Famous — the Dayton CUB. 200 gallons per hour.

Can You *afford* to Pump and Carry

When Running Water Costs So Little?

WITH electric power available it is no longer good business to pump and carry water. A DAYTON system will furnish fresh running water for every purpose at a cost of only a few cents a day. Permits the piping of water to barns and outbuildings—not a drop to carry. Makes possible a modern kitchen, and a bathroom with all modern fixtures. These are comforts you can't afford to deny yourself for a few cents a week. A DAYTON Water System will give you every convenience of "city water" at a surprisingly low cost.

Write for complete information and prices.

The Dayton Pump & Mfg. Co.

Pioneer Manufacturers of Private Water Systems

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Dayton WATER Systems

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What is Your Title for the Cover?

ELECTRICITY ON THE FARM offers a $25.00 cash prize for the best title for the picture shown on the cover of this issue (October).

RULES OF CONTEST

1. Contest closes November 5.

2. Contestant must be a farmer or a member of his family *living on the farm.*

3. More than one title may be submitted.

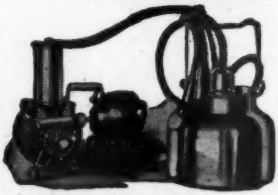
4. In case of a tie, each winning contestant will receive $25.00.

5. Print plainly your name and address, and send your suggestion to Title Editor, ELECTRICITY ON THE FARM, 225 West 34th Street, New York, N. Y.

6. The winner for October will be announced in ELECTRICITY ON THE FARM for December.

Readers submitting titles are requested to include a brief outline of the use made of electric current on their farms.

Fords $100 Simple Unit Complete
Milker



Clean, Low Count Milk

Prize herds, the finest cows in the country, are now milked with Fords Milker. Thousands of farmers are using it to get cleaner, low count, premium-priced milk and saving time, money and drudgery. Our sales doubled last year. Compact, easily cleaned—guaranteed to equal any milker at any price.

Distributers Wanted
Splendid opportunity for merchants and farmers.

SEND for our FREE booklet No. 74.

Myers-Sherman Co.
213 N. Desplaines St., Chicago, Ill.

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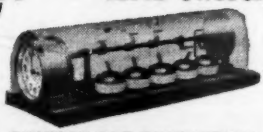
Never-Fail
TIME SWITCH



DOUBLES EGG PRODUCTION

Hens go to roost at dark, losing from 1 to 3 hours a day in fall and winter months. Reliable records show 75 to 150 per cent increase when electric lights are used. This practically doubles the profit from your flock.

Keeps Hens Working 12 Hours a Day

In many electric lighted hen houses, the failure to turn lights on and off at the right time, interferes with production. At about the cost of one egg per night during Fall and Winter months, the Never-Fail Switch turns lights on or off, dim or bright at the right time. Easy to install—pays for itself quickly. Used by successful poultrymen everywhere. Sold direct or through dealer. Write today for circular giving your dealer's name.

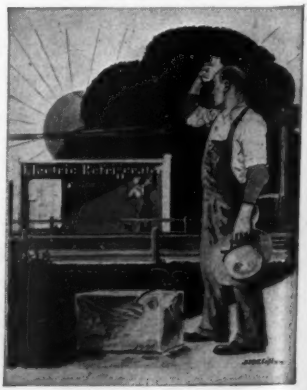
J. E. GILSON CO.
840 Western Avenue
Port Washington, Wis.

Here's the Winning Cover Title for August

> **"A warm reception of a cold fact"**
>
> **T. E. Andrew, R. R. 6, Salem, Ore.**

AND these also deserve special commendation:

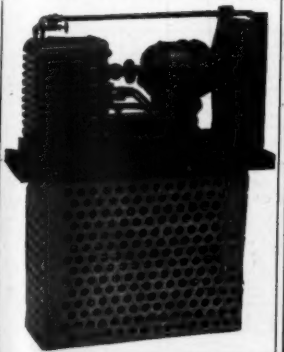
"Electric refrigeration costs less—and paves the road to happiness," Edna E. Nelson, Sioux Falls, S. Dak.; "This New Electric Device Means—No More River Ice," Carolyne S. Meyer, Puyallup, Wash.; "Electric refrigerators work like a charm, and save the food down on the farm," Mrs. J. H. Winnings, Danville, Ind.; "Why Carry the Burden, when Electricity is at your Door?" Marguerite H. Williams, Palatka, Fla.; "A Few Cents an Hour Keeps Milk from Getting Sour," Frank Schubert, Appleton, Wisconsin; "For Better Household Administration use Electric Refrigeration," Helen Mary Steere, Ann Arbor, Mich.; "Ever-ready Ice at a very small price," Mrs. John Boddicker, Watkins, Iowa; "When the sun is hot as fire let your ice come by wire," E. E. Zeller, Richmond, Va.; "Cool Deliberation," Mrs. C. D. Bearden, Hillsboro, Texas; "The Cold Truth," Miss Virginia D. Amos, Warminster, Pa.; "Sweating Over Cold Facts," F. E. Braniger, Oklahoma City, Okla.; "No more back aches, no more toil, no worry that our food will spoil," Mrs. Wm. E. Bliss, Hartford, Wis.; "Getting ice—Oh what a groan, Touch a button—make your own," Anna H. Rozell, Salt Point, N. Y.



"A Warm Reception of a Cold Fact"

A BETTER WAY TO COOL MILK

The Haven Electric Farm Milk Cooling System was designed especially for farm service in cooperation with leading milk companies. Anyone can install. No expert knowledge required. Reduces bacteria count, increases milk quality, saves labor, space, expense. Low price. Backed by definite capacity and quality guarantee.

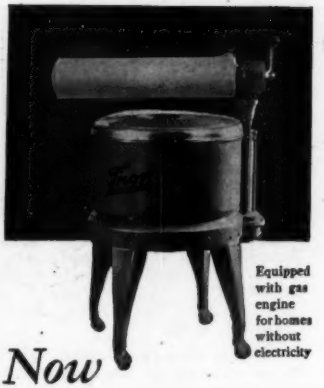


Complete machine, simple, sturdy, compact, lifts right out of tank.

Price $325.00, f. o. b. Milwaukee. Tank extra if required. Easy monthly terms can be arranged. Write for Bulletin "B."

(A few good dealer territories open)

Haven Manufacturing Co.
Milwaukee, Wisconsin



Equipped with gas engine for homes without electricity

Now

a Washing and Ironing Machine Combined

At a price formerly asked for a washing machine alone

WOMEN on the farms—you can now be rid of the drudgery of both washing and ironing, and pay no more than you have been asked for a good washing machine.

The Hurley Machine Company has just perfected this complete laundry unit—the first and only machine of its kind. It combines the Thor Agitator—world's most thorough and efficient speed-type washer—with the New Thor Rotary Iron, that does your ironing in one-fifth the time required by hand.

The Thor name on this new laundry unit is your assurance of lasting satisfaction. Write us for illustrated booklets describing this and other Thor home laundry equipment.

THE HURLEY MACHINE CO.
22nd Street and 54th Avenue
Dept. B Chicago, Ill.

NEW BULLETINS AVAILABLE

The booklets, catalogs and descriptive leaflets listed below can be secured without cost by writing directly to the addresses given and mentioning that you saw them described in ELECTRICITY ON THE FARM.

Electric Incubating and Brooding, advantages and costs, are fully explained in a bulletin obtainable from the Wellington J. Smith Co., 600 Davis Farley Bldg., Cleveland, Ohio.

"Every Day a Happy Day" is the name of an interesting leaflet which describes the Dayton Water System and which is available from Dayton Pump & Mfg. Co., Dayton, Ohio.

Milking Machine practice is fully covered in bulletin No. 74, to be obtained from the Myers-Sherman Co., 213 No. Desplaine St., Chicago, Ill.

"Water in Abundance" is the title of a very attractive booklet describing the various types of Myers Water Systems. Write for catalog WS-29 to F. E. Myers & Bro. Co., Ashland, Ohio.

"The New Electric Whip-it Feed Mill" is the title of a folder on feed grinding which you can secure from the I. B. Rowell Co., at Waukesha, Wis.

Portable Electric Clipping and Grooming Machines are fully described in a booklet published by and available from the Gillette Clipping Machine Co., Inc., 129 W. 31st St., N. Y. C.

"Complete Water Service, Hard-Soft-Hot-Cold-Water" gives a detailed explanation of the Milwaukee Air Power Water System which can be secured by writing to the Milwaukee Air Power Pump Co., Milwaukee, Wis.

Shortening ironing days to ironing hours is explained in leaflet No. AIR-4, obtainable from the Hurley Machine Co., 22nd St. & 54th Ave., Chicago, Ill.

Every progressive farm needs one

The Gillette Portable Electric Clipping and Grooming machine has a direct connected motor. Its reliability explains its popularity. Just plug into any lighting outlet—it is ready for work. Hanging or Pedestal types.

Dealers—Send for attractive price list.

Gillette Clipping Machine Co., Inc.
129 W. 31 St., Dept. 11 New York City

CLASSIFIED ADVERTISING

NEW MOTORS—½ Hp.* alternating Westinghouse $25.50; ¾ Hp. $7.50; ⅓ Hp. $6.50. 32 Volt ½ Hp. $24.50; 1/3 Hp. $20.00; ¾ Hp. $8.50. Workshop motors with emery wheel, buffer and drill chuck $8.50. Write for prices on larger motors; also generators. QUEEN CITY ELECTRIC CO., 1742 Grand Avenue, Chicago, Illinois.

* The Publishers regret a typographical error in this advertisement last month—quoting ½ Hp. instead of ¾ Hp. motors for $7.50.

BARGAINS—Motors, Machinery, Washing Machine Motors, $5.50; ⅓ hp., $15.75; electric Drills, $13.95; Electric Grinders, $7.45; Generators, $16.95; Electric Vacuum Cleaners, $8.95. Big stock farm plant equipment. 100 other bargains. Send for Bulletin 626. Acme Tool Co., 627 W. Washington, Chicago, Ill.

HATCH WITH ELECTRICITY

POULTRYMEN AND POWER COMPANIES INTERESTED IN

BROOD WITH ELECTRICITY

Water where you want it and how to get it is explained in a folder published by The John Lauson Mfg. Co., New Holstein, Wis.

"The Range That 'Gets Meals' All By Itself" is the name of an interesting folder published by the Westinghouse Elec. & Mfg. Co., East Pittsburg, Pa.

The Farm Motor

(*Continued from page* 10)

equipment should be inspected and oiled, if necessary.

In any motor there are only 2 places where any wear can occur due to friction, namely, in the bearings, and where the brushes rub on the commutator. These 2 places should be inspected and, of course, it is important that the motor windings be kept clean.

Motor Bearings

Motors usually have either roller bearings, ball bearings, or plain sleeve bearings lubricated by wicks or oil rings. Tilting a motor when moving it may cause the oil to spill from a sleeve bearing so that the oil rings do not carry enough oil. The oil must be kept at the proper level in this type of bearing. Ball bearings or roller bearings, if thoroughly packed with grease will usually go for months without further attention. The smaller motors such as used on sewing machines are usually wick lubricated and a few drops of oil on the wick every 3 or 4 weeks are necessary.

Bolted flange couplings are often a source of unsuspected trouble due to the fact that the motor and the machine it drives are not accurately lined up. This misalignment causes strains on the bearings and excessive friction. To avoid any such possibility it is always better to use some form of simple flexible coupling whenever a motor and machine are direct connected.

(*Continued in November issue*)

These roller bearings save 20% power —assure *quiet* pumping—longer life

"BEVAN" roller bearings outwear a dozen plain bearings, and require little attention. The same type bearings are used in automobile axles to minimize friction and give quiet running. "BEVAN" also has a simple, patented method of distributing power from motor to pump by a walking beam that gives long leverage on lifting stroke — saves half the power ordinarily needed to lift water. All side thrust and jerking are eliminated.

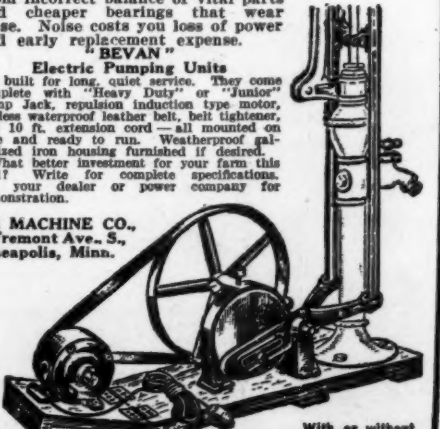
A grumbling pump jack is on the way to wearing out. Noise comes from incorrect balance of vital parts and cheaper bearings that wear loose. Noise costs you loss of power and early replacement expense.

"BEVAN"
Electric Pumping Units

are built for long, quiet service. They come complete with "Heavy Duty" or "Junior" Pump Jack, repulsion induction type motor, endless waterproof leather belt, belt tightener, and 10 ft. extension cord — all mounted on base and ready to run. Weatherproof galvanized iron housing furnished if desired.

What better investment for your farm this Fall? Write for complete specifications. Ask your dealer or power company for demonstration.

ACME MACHINE CO.,
2901 Fremont Ave., S.,
Minneapolis, Minn.



With or without automatic control

Pump Your Water by Electricity

Only $58.00

Here is the little direct connected gear driven suction plant which has been brought out to meet the demands for a low priced, high class water system. There is no belt to slip and thus lower the efficiency of the system. It is a neat, compact little unit; has a delivering capacity of about 300 gallons per hour and only costs $58.00. In producing a system at this low price we have not sacrificed quality for cheapness.

We manufacture other sizes and styles of suction plants, deep well working heads, water softeners, septic tanks, drinking cups for stock, etc. Prices on water equipment, $58.00 and up. Write us about your requirements and for literature, without obligation.

MILWAUKEE AIR POWER PUMP CO.
6 Keefe Ave., Milwaukee, Wis.

Oakes Electric Equipment

Hatch Bigger Better Chicks — **Raise More Chicks Easier**

The Electric Hen hatches every good egg. Safe and economical to operate. Made in 50, 100, and 165 egg sizes.

RAISING chicks electrically is sure, simple, easy. Poultry and farm magazines recommend it.

Every farmer who raises poultry for profit should be interested in the complete line of Oakes quality poultry supplies—incubators, brooders, fountains, feeders, electric egg testers, etc. Write today for complete illustrated catalog.

BIG CATALOG FREE

OAKES MANUFACTURING CO.
77 Dearborn St., TIPTON, INDIANA